

Claims:

- 1 1. A process for coating, at least in part, a carbon black with an adhering layer of
2 aluminum oxide and/or hydroxide, comprising:
3 a) impregnating the carbon black with a colloidal suspension formed by
4 hydrolysis of a solution of aluminum alkoxide in an alcoholic solvent.
5 b) removing the alcoholic solvent by evaporation; and
6 c) heat-treating the black thus impregnated so as to transform the aluminous
7 layer present at its surface into an adhering layer of aluminum oxide and/or hydroxide.
2. The process of Claim 1, wherein the aluminum alkoxide is an alkoxide
 comprising 1 to 6 carbon atoms.
3. The process of Claim 2, wherein the aluminum alkoxide is selected from the
 group consisting of aluminum methoxide, aluminum ethoxide, aluminum (iso)propoxide
3 aluminum butoxides, and mixtures thereof.
- 1 4. The process of Claim 1, wherein the alcoholic solvent is selected from the group
2 consisting of methanol, ethanol, (iso)propanol, the various isomers of butanol, and mixtures
3 thereof.

5. The process of Claim 1, wherein the colloidal suspension comprises nitric acid as a hydrolysis catalyst for the aluminum alkoxide solution.

6. The process of Claim 1, wherein the heat treating is carried out at a temperature of between 100 and 900°C.

7. A modified carbon black coated with an adhering layer of aluminum oxide and/or hydroxide, obtainable by the process according to any one of Claims 1 to 6.

8. The modified carbon black of Claim 7, wherein the modified carbon black has an amount of surface aluminum greater than 0.25% (% by mass).

9. The carbon black of Claim 8, wherein the amount of surface aluminum is between 0.5% and 5% (% by mass).

10. A modified carbon black, characterized by:

- (i) being coated at least in part by a layer of aluminum oxide and/or hydroxide;
- (ii) having a specific BET surface area of between 30 and 400 m²/g;
- (iii) having an average particle size (by mass), d_w , of between 20 and 400 nm;

6 and having an

7 (iv) ultrasound disagglomeration rate, α , greater than $1 \times 10^{-3} \mu\text{m}^{-1}/\text{s}$, said rate
8 being measured via an ultrasound disagglomeration test at 10% power of a 600 watt ultrasonic
9 probe.

1 11. The carbon black of Claim 10, wherein the disagglomeration rate α is greater than
2 $1.5 \times 10^{-3} \mu\text{m}^{-1}/\text{s}$.

12 The carbon black of Claims 10 or 11, wherein the black has an amount of surface
aluminum greater than 0.5% (% by mass).

13 The carbon black of Claim 12, wherein the amount of surface aluminum is
between 0.5% and 5%.

1 14. The carbon black of Claim 13, wherein the amount of surface aluminum is
2 between 0.5% and 3%.

1 15. A process for producing a reinforcing carbon black for tires, the carbon black
2 having the following characteristics:

3 (i) it is coated at least in part by a layer of aluminum oxide and/or hydroxide;

- 4 (ii) its specific BET surface area is between 30 and 400 m²/g;
5 (iii) its average particle size (by mass), d_w, is between 20 and 400 nm;
6 (iv) its ultrasound disagglomeration rate, α, is greater than 1x10⁻³ μm⁻¹/s,

7 wherein said rate is measured via an ultrasound disagglomeration test of 10% power of a 600
8 watt ultrasonic probe;
9 the process comprising

- 10 a) impregnating a starting tire-grade carbon black with a colloidal suspension
11 formed by hydrolysis of a solution of aluminum alkoxide in an alcoholic solvent;
12 b) removing the alcoholic solvent by evaporation; and
13 c) heat-treating the black thus impregnated so as to transform the aluminous
14 layer present at its surface into an adhering layer of aluminum oxide and/or
15 hydroxide.

16. The process of Claim 15, wherein the starting carbon black is a reinforcing
2 carbon black selected from the series 100, 200 or 300 (ASTM grades).

1 17. The process of Claim 15, wherein the aluminum alkoxide is an alkoxide
2 comprising 1 to 6 carbon atoms.

1 18. The process of Claim 17, wherein the aluminum alkoxide is selected from the

1 group consisting of aluminum methoxide, aluminum ethoxide, aluminum (iso)propoxide,
2 aluminum butoxides and mixtures thereof.

1 19. The process of Claim 15, wherein the alcoholic solvent is selected from the group
2 consisting of methanol, ethanol, (iso)propanol, the various isomers of butanol, and mixtures
3 thereof.

1 20. The process of Claim 15, wherein the colloidal suspension comprises nitric acid.

1 21. The process of Claim 15, wherein the heat treating is carried out at a temperature
2 of between 100 and 900°C.

1 22. A process for reinforcing a diene rubber composition which can be used for the
2 manufacture of tires, comprising incorporating a carbon black according to any one of Claim 10
3 into the composition by mixing in an internal mixer, before introducing a vulcanization system.

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